

We claim:

1. A composition comprising a matrix and a recombinant bidomain protein or peptide having an amino acid sequence that comprises a transglutaminase substrate domain and a bioactive factor, wherein the protein or peptide is covalently bound to the matrix by the transglutaminase substrate domain.
2. The composition of claim 1 wherein the matrix comprises fibrin.
3. The composition of claim 2 wherein the transglutaminase substrate domain is a Factor XIIIa substrate domain.
4. The composition of claim 3 wherein the Factor XIIIa substrate domain comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, and combinations and bioactive fragments thereof.
5. The composition of claim 3 wherein the Factor XIIIa substrate domain comprises an amino acid sequence of SEQ ID NO: 15.
6. The composition of claim 1 wherein the bioactive factor is a peptide.
7. The composition of claim 1 wherein the bioactive factor comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, TGF- β 1, BMP 2, VEGF₁₂₁, PDGF AB, PTH, and combinations and bioactive fragments thereof.
8. The composition of claim 1 wherein the bioactive factor is a polypeptide growth factor.
9. The composition of claim 8 wherein the bioactive factor is selected from the group consisting of VEGF, a growth factor from the TGF- β superfamily, PDGF, growth hormone, IGF, and ephrin.

10. A method of attaching a bioactive factor to a matrix, comprising recombinantly producing a biodomain peptide or protein comprising a bioactive factor and a transglutaminase substrate domain; and

exposing the matrix to a transglutaminase to covalently couple the biodomain peptide or protein to the matrix and crosslink the matrix.

11. The method of claim 10 wherein the matrix comprises fibrin.

13. The method of claim 10 wherein the transglutaminase substrate domain is a Factor XIIIa substrate domain and the transglutaminase is Factor XIIIa.

14. The method of claim 13 wherein the Factor XIIIa substrate comprises an amino acid sequence is selected from the group consisting of SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, and a combination or bioactive peptide fragment thereof.

15. The method of claim 14 wherein the Factor XIIIa substrate comprises an amino acid sequence of SEQ ID NO: 15.

16. The method of claim 10 wherein the bioactive factor is a polypeptide growth factor.

17. The method of claim 10 wherein the bioactive factor is selected from the group consisting of VEGF, growth factors from the TGF- β superfamily, PDGF, growth hormone, IGF, and ephrin.

18. The method claim 10 wherein the bioactive factor contains an acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, TGF- β 1, BMP 2; VEGF₁₂₁, PDGF AB, and PTH, and a combination or bioactive peptide fragment thereof.